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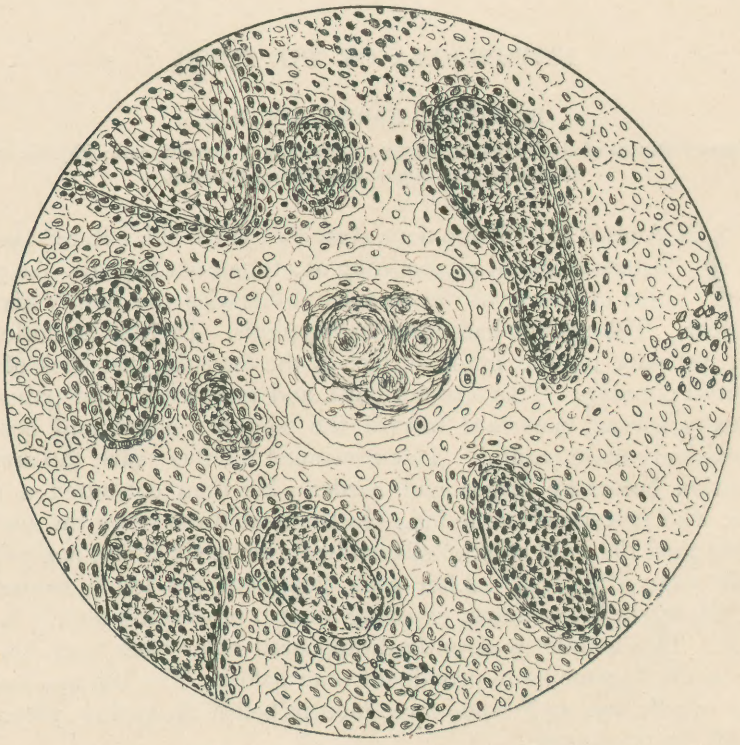
ON August 31, 1893, a man, sixty-two years old, entered the St. Agnes Hospital complaining of a tumor of the penis. An aunt died of cancer of the stomach, otherwise the family history was clear. The patient had never had syphilis. In 1885 he noticed a small red spot on the inner surface of the foreskin, just back of the preputial opening. This was not hard, and gave very little pain. It gradually spread backward toward the coronary sulcus and became progressively more painful. This continued for five years, the area of ulceration becoming larger and harder He then consulted a physician, who cauterized the lesion. In the next three years the patient himself used the solid stick of silver nitrate some six times, applying a simple salve afterward. After each treatment the lesion seemed to heal, but again broke down, exposing a hard, protruding nodule in the center. This nodule apparently disappeared after each burning, but later would become more prominent than before. The last application of the caustic was made some three months before the patient presented himself for treatment.

On examination, the patient was found to be phimotic, with slight œdema of the prepuce, adhesions between the latter and the glans of the upper surface, and a hard, irregular nodule the size of the end of the thumb distinctly perceptible in this region. This nodule extended one quarter of an inch behind the corona. On strongly retracting the prepuce, a hard, projecting mass of what appeared to be indolent granulation tissue was exposed. Neither the inguinal glands nor the dorsal lymphatics of the penis were perceptibly enlarged. In the last six months the patient experienced sharp, lancinating pains and had a

slight blood-stained discharge from beneath the foreskin. He gave no history of sore or injury of any kind preceding the development of his lesion.

Operation in this case was performed in the ordinary manner at the middle of the pendulous portion, an inch and a half behind the posterior border of the hardened mass. The spongy body was cut half an inch longer than the cavernous bodies, and the urethra was split and attached above and below to the skin flaps, which were made oval.



Section of epithelioma of the penis.

I present a drawing of a cross-section of the growth, showing typical epithelial formation. Ribbon sections were taken of the whole substance of the penis, passing from the center of the growth backward. The line of demarcation between healthy and diseased tissue was, as is usual with epithelioma, rather sharply marked. The cavernous body of the right side was involved to a slight degree, but a quarter of an inch behind the posterior border of the perceptible enlargement the tissues of the penis were found to be absolutely healthy,

and the amputated section, of course, showed entire absence of epithelial infiltration—a good example of the slow course of these lesions, the local trouble in this particular case dating back eight years.

Nine months are now past, and the patient is still free from recurrence either in the stump of the penis or the lymphatic glands of the groin. The artificial opening of the urethra has not contracted, and he is troubled only with a stricture of twenty-two caliber, just anterior to the triangular ligament, which he refused to have cured at the time of his operation.

This case, one of seven epitheliomas of the penis that I have seen, I had taken as the text for a general study of epithelial cancer involving the penis; but since the publication of Dr. R. W. Taylor's classical paper upon this whole subject, a general rehearsal of the facts he has so clearly brought forward would be out of place, and I shall therefore confine myself to a very brief discussion of one or two points in relation to this subject which have seemed to me of special interest.

As to the ætiology of the disease, phimosis is almost universally acknowledged to be a strong predisposing factor, and in six of the seven cases I have seen this condition was present before the development of skin cancer. Traumatism is also usually recognized as a predisposing factor, one of the clearest cases of this nature reported being that of Krönlein, quoted by Klebs. Direct contagion is usually denied, but a search of literature recently made by MacFarland showed thirteen cases, eight of them being instances of contagion from the wife to the husband; Sorel's paper upon the contagiousness of cancer; Arnaudet's cases, the contagion being traced to drinking water; and Cornil's report of the transplantation and growth in two patients, all point toward direct contagion. Hahn also observed that cancerous nodules when transplanted to a healthy part of the body grow. Moreover, Fiessinger and Guelliot report some curious cases, showing that a number of persons living in the same locality and under similar surroundings may be attacked with cancer, thus constituting a limited epidemic. When it is remembered how recently the contagious character of phthisis was contested, and at that time how few were the carefully reported cases tending to show this contagiousness, it does not seem unreasonable to believe that the contagious nature of cancer may one day be as clearly recognized as is that of tuberculosis.

Jacobson, in discussing this subject, quotes Bruce's case. The patient lost his wife from cancer of the uterus, from which she had suffered for many years. In the following year he noticed a small warty growth upon the glans, which subsequently became a typical epithelioma. This case Jacobson states is almost an isolated one, and

the apparent connection between the two diseases is only a coincidence. In the light of the evidence now accumulating this view should be modified.

Syphilis has been repeatedly quoted as a predisposing factor in the development of cancer. This ground is scarcely tenable and is certainly not generally accepted, though Demarquay of fifty-nine cases found that ten had suffered from syphilis. I have seen one case in which the history was singularly clear. The patient was thirty-two years old. At the age of twenty-two he contracted a chancre in the coronary sulcus to the right side. This healed in the course of one or two months. The following constitutional disease was light, and was somewhat irregularly treated. A distinct cicatrix was left at the seat of the old chancre. Nine years after the appearance of the primary lesion this cicatrix became inflamed, ulcerated, and shortly formed an irregular, ragged excavation with hard, nodular edges. This was thoroughly cauterized, but even before cicatrization had taken place the lesion again became unhealthy and began to extend. In three months the glans was destroyed and the disease had invaded the cavernous bodies, forming a cauliflower mass above, with a hard, deep ulcer below, which had already opened the urethra. The inguinal glands of the right side were moderately enlarged, but no more so than is often observed in syphilitics. The penis was amputated at the peno-scrotal junction. In a month the wound had become cancerous in appearance and the inguinal glands greatly enlarged. They suppurated, the disease extended along the pelvic glands, and the patient perished from exhaustion twenty months after the first appearance of his disease. Microscopic examination of the tumor showed it to be epithelioma.

I have seen one other syphilitic develop carcinoma. A hurried sketch of this lesion I present to you. There was, however, no clear history of a scar of a chancre, and no relation between syphilis and epithelioma could be traced.

Jacobson reports a case somewhat similar to the one detailed. The patient exhibited the cicatrix of a chancre which twenty-seven years later became a raw surface, it extended from time to time and then healed up. Three years later this inflamed patch became distinctly warty. It was destroyed by glacial acetic acid, but fresh warts formed at the site of the lesion. A year before the patient's death the sore became indurated and then steadily extended. In these cases I believe the syphilitic virus had absolutely nothing to do with the epithelioma, the scar of the old lesion simply acting as a focus of lessened resistance.

The prognosis of epithelioma of the penis is guardedly favorable. In the precancerous stage—that is, in the stage of continued irritation

taking the form of localized balanitis or balano-posthitis, of warty growth which has a tendency to infiltrate and ulcerate, or of circumscribed induration—prompt and efficient intervention will be followed by radical cure in the very large majority of cases. Somewhat later, when the disease is typically developed, the prognosis is less favorable, because the lymphatic glands of the groin are commonly involved, and because by direct extension the disease has traveled so far back that the operations ordinarily undertaken for its removal are insufficient, and recurrence *in loco* takes place. Of Demarquay's one hundred and thirty-four cases recurrence in the scar took place in eight (six per cent). In two of the three operative cases I have seen the seat of section became cancerous. Gussenbauer holds that the inguinal lymphatics are with few exceptions involved very early in the disease. Even though palpation reveals no material increase in size, the microscope will nearly always show cancerous deposits. Thus, of forty-eight cases, involvement of the inguinal glands was found in forty—thirty bilateral, ten unilateral. Even though the lymphatic glands be already enlarged, it is not certain that this is due to infiltration of the cancerous cells. It may be simply inflammatory and may disappear after thorough removal of the cancer. Smith and Demarquay each report a case in which the inguinal lymphatic enlargement entirely disappeared after removal of the diseased penis. Visceral metastases are extremely rare. Winiwarter quotes but six cases.

If untreated the disease is, of course, necessarily fatal, but may run a course of ten years or more. Death usually takes place from hæmorrhage from exhaustion. Operation distinctly prolongs life even when the cancer is so extensive that complete removal of all infiltrated tissue is not possible.

Hildano removed a cancer the size of a child's head from a patient aged eighty years. This man survived for ten years. Lebert and Pitha report four cases of permanent cure. Pitha observed his two cases nine and twelve years respectively after operation. Thiersch reports three radical cures four, six, and seventeen years after operation. Winiwarter reports four cures observed from one to seven years.

Horteloupe reports a case well after four years. He removed all the inguinal glands on both sides. Southam completely removed the external genitals for epithelioma of the penis and scrotum, with no recurrence at the end of six years. In this last case there was no microscopic examination. Polaillon and Dubuc report the case of a man of fifty-four whose epithelioma had destroyed the penis, involved the subcutaneous tissue over the symphysis, and implicated both cords. The entire external genitals, the mons Veneris, the scrotum, and testi-

cles were removed mainly by thermo-cautery, the urethra being cut off from the perinæum. Nine months later there was no relapse.

Hutchinson reports a case extending along the course of the urethra. The corpus spongiosum was dissected back in order to get to the healthy part. The urethra was brought out through an opening in the perinæum. In spite of this wide section there was recurrence at the new urethral orifice.

An accurate knowledge of the percentage of recurrence after thorough extirpation can scarcely be obtained, since there is a natural tendency to report only those cases which are successful or which present certain peculiarities. Recurrence *in loco* or in the glands is expected as a rule, and when it occurs the case rarely finds its way into literature. Cancer of the penis is comparatively so rare that there is probably no individual experience sufficiently comprehensive to give the required data. In performing the operation, however, I believe we can arrive at a very clear idea as to the chance of radical cure in individual cases by careful microscopical examination of the parts removed. When the penis is amputated cross-sections should be taken at the seat of amputation, and these should be carefully examined for cancerous infiltration. Where the suspicious growth is extirpated, similar examination should be made upon the entire periphery of the growth. Even though these sections show healthy tissue, this of course does not guard against glandular recurrence. I believe, however, that in all cases where the cancer is typically developed the inguinal and lymphatic glands of both sides should be removed and a microscopic examination of these specimens should throw valuable light as to the presence or absence of infection.

As to the operation, this, in the precancerous stage—that is, when the disease can not be clearly recognized as cancer—may consist in thorough cauterization, or in excision followed by cauterization. In case the wound does not heal kindly, amputation of the penis should be performed at once. If cross-section shows involvement at the point of amputation, extirpation is indicated. In the latter case, when there are any remains of virility, castration is also advisable, but not when partial amputation is performed. I have seen one patient amputated at the peno-scrotal junction in whom an amount of erection was obtainable which, according to his own statement, was not only a source of satisfaction from a cosmetic standpoint, but which also enabled him to continue his conjugal relations with satisfactory results. In all cases where the amputation of the penis is required I believe the groin should be opened freely and the entire chain of lymphatic glands should be removed whether they are enlarged or not. This operation, if per-

formed before there is extensive periadenitis, is perhaps a trifle tedious, but is perfectly safe and is not difficult.

The two points to which this paper was designed to call especial attention are:

1. That it is not justifiable positively to deny the possibility of contagion in epithelioma of the penis.

2. That when amputation of the penis is required the inguinal glands of both sides should be dissected out, even though they are not appreciably enlarged.